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Indiana Department of Education

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Linking Study Between the Indiana Academic Standards (2014) for English/Language Arts and Mathematics, the Indiana Academic Standards for Science (2010), and the WIDA English Language Proficiency Standards

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Introduction

Background

This study was an evaluation of the alignment between the Indiana Academic Standards (2014) and the WIDA English Language Proficiency Standards in the areas of Reading, Mathematics, and Science. Indiana will fully implement the WIDA standards beginning in the 2014-2015 school year. Per Indiana's approved ESEA Flexibility Waiver, the Office of English Learning and Migrant Education and Office of Student Assessment sought guidance from WIDA in order to conduct an alignment study of the current Indiana Academic Standards and the WIDA English language development (ELD) standards. The Indiana Department of Education conducted the alignment study in the Fall of 2014. This study evaluated the relationship between the WIDA English language development standards and the state's academic content standards: linking and alignment (U.S. Department of Education, Office of English Language Acquisition, February 2003). It was determined that the study would solely include the requirement of linking at this time. The study produced this report which is available to all stakeholders on IDOE's website.

The text below is drawn from federal non-regulatory guidance as it relates to English language proficiency standards and the issue of alignment.

> B-3. What is the relationship between English language proficiency standards, English language proficiency annual measurable achievement objectives, and English language proficiency assessment?
>
> > English language proficiency standards ***must, at a minimum***, ***be linked*** to the State academic content and achievement standards. States are ***encouraged, but not required***, to align English language proficiency standards with academic content and achievement standards. Annual measurable achievement objectives for English language proficiency serve as targets for achievement of the English language proficiency standards. English language proficiency assessments must be aligned with English language proficiency standards and provide a means of demonstrating progress towards meeting the English language proficiency annual measurable achievement objectives. (U.S. Department of Education, Office of English Language Acquisition, February 2003, pp.9, 10).

The italicized, highlighted phrases in the text above represent how the federal government has expanded upon alignment, traditionally seen as a relationship between standards and assessments, to also include the linking between a state's English language development standards and its state academic content standards. Federal guidance requires a minimum criterion of linking student expectations.

Webb's (1997) alignment methodology, which has traditionally been used to evaluate the alignment between academic content standards and academic content assessments, has been adapted to study the alignment between different sets of standards (e.g., English language proficiency and academic content). Cook (2005) explains that more of a one-to-one correspondence is expected when aligning

two sets of standards than when examining the alignment between a set of standards and an assessment. Thus, the criteria for acceptable levels of key alignment statistics are different for standards-to-standards alignment than for test-to-standards alignment[1].

For this study, the results of the *Alignment Study between the Common Core State Standards in English Language Arts and Mathematics and the WIDA English Language Proficiency Standards, 2007 Edition, Prekindergarten through Grade 12* (Appendix A), and the *Indiana Academic Standards Correlation Guide Documents* (Appendix B), were analyzed to show a strong linkage between the Indiana Academic Standards (2014) and the WIDA English Language Development Standards that meets the federal requirement.

Linking

A state's English language proficiency standards must be, at a minimum, linked to its academic content standards. By linking, at least one aligned content standard in each assessed subject must be represented in the English language proficiency standards at each grade cluster.

Standards Linked in this Study

The following are brief descriptions of the four sets of standards linked in this study:

Indiana Academic Standards (2014)

English/Language Arts

In April of 2014, the Indiana State Board of Education approved the adoption of new standards for English/Language Arts. These new standards have been validated as college and career ready by the Indiana Commission for Higher Education, the Indiana Department of Education, and the Indiana Center for Education and Career Innovation. This means that students who successfully master these English/Language Arts objectives, which represent what they should know and be able to do by the time they graduate from high school, will be ready to go directly into the workplace or a postsecondary educational opportunity without the need of remediation.

Instruction in English (literature, composition and speech) and language arts (reading, writing, speaking, listening and viewing) provides vital content for lifelong learning and problem solving in our increasingly complex technological world. English/Language Arts (ELA) instruction engages students in the essential thinking skills and processes used across subject areas.

[1] http://wida.us/get.aspx?id=371

Indiana Academic Standards (2014)

Mathematics

In April of 2014, the Indiana State Board of Education approved the adoption of new standards for Mathematics. The 2014 Indiana Academic Standards for Mathematics are the result of a process designed to identify, evaluate, synthesize, and create the most high-quality, rigorous standards for Indiana students. The standards are designed to ensure that Indiana students are prepared to enter and successfully complete postsecondary education and that they are prepared for long-term, economically-viable career opportunities.

The Indiana Academic Standards for Mathematics demonstrate what students should know and be able to do in the areas of K-8 Mathematics; Algebra I, II, and Geometry; and higher-level high school Mathematics courses. Instruction in Mathematics provides vital content and skills for lifelong learning and problem solving in our increasingly complex technological world and engages students in the essential thinking skills and processes used across subject areas.

These new standards have been validated as college and career ready by the Indiana Education Roundtable, the Indiana Commission for Higher Education, the Indiana Department of Education, the Indiana Center for Education and Career Innovation, and the Indiana State Board of Education. This means that students who successfully master these objectives, which represents what they should know and be able to do in Mathematics disciplines by the time they graduate from high school, will be ready to go directly into the workplace or a postsecondary educational opportunity without the need for remediation.

Indiana Academic Science Standards

Indiana's Academic Standards for Science were last revised in 2000. This new document, Indiana's Academic Standards for Science 2010, reflects the ever-changing science content and the underlying premise that science education should be an inquiry-based, hands-on experience. These standards were adopted by the Indiana State Board of Education in April, 2010, and were implemented beginning in the 2011-12 school year. Indiana's Academic Standards for Science – 2010 reflect a few significant changes that are worth noting. Primarily, there are fewer standards and each grade level focuses on the big ideas for each of these sub-disciplines: physical science; earth science; life science; and science, technology and engineering.

WIDA English Language Development Standards

The WIDA English Language Development Standards (WIDA, 2012) are comprised of the following five standards:

1. English language learners communicate in English for SOCIAL AND INSTRUCTIONAL purposes within the school setting.

2. English language learners communicate information, ideas, and concepts necessary for academic success in the content area of LANGUAGE ARTS.

3. English language learners communicate information, ideas, and concepts necessary for academic success in the content area of MATHEMATICS.

4. English language learners communicate information, ideas, and concepts necessary for academic success in the content area of SCIENCE.

5. English language learners communicate information, ideas, and concepts necessary for academic success in the content area of SOCIAL STUDIES.

Each standard covers four language domains: listening, speaking, reading, and writing. The model performance indicators for each standard are organized into four grade-level clusters (K-2, 3-5, 6-8, and 9-12). Within each framework, grade cluster and language domain, there are model performance indicators for each language proficiency level. The model performance indicators are functional, measurable indices of the language domains (listening, speaking, reading, and writing) and aimed at the targeted age and developmental levels of English language learners. Model performance indicators are purely examples that have been drawn from a number of English language proficiency and state academic content standards. There are three components of a model performance indicator: 1) language function (how the students use language), 2) content stem (what the students are expected to communicate), and 3) support (how the students process the input either through oral or written language).

Review Process

The Indiana Department of Education utilized subject area experts to conduct the linking study. The experts utilized the *Alignment Study between the Common Core State Standards in English Language Arts and Mathematics and the WIDA English Language Proficiency Standards, 2007 Edition, Prekindergarten through Grade 12* (Appendix A), *Indiana Academic Standards Correlation Guide Documents* (Appendix B), *WIDA English Language Proficient Standards and Resource Guide, 2007 Edition*, and *2012 Amplification of The English Language Development Standards Kindergarten – Grade 12* to show a strong linkage between the Indiana Academic Standards (2014) and the WIDA English Language Development Standards.

Step 1

The experts reviewed the Indiana *Academic Standards Correlations Guide Documents* to determine the correlation between the Indiana Academic Standards (2014) and the Common Core State Standards.

Step 2

The experts analyzed the results of *Alignment Study between the Common Core State Standards in English Language Arts and Mathematics and the WIDA English Language Proficiency Standards, 2007 Edition, Prekindergarten through Grade 12.*

Step 3

The experts examined the correlation between the two sets of standards and the linking conclusions found in the *Alignment Study between the Common Core State Standards in English Language Arts and Mathematics and the WIDA English Language Proficiency Standards, 2007 Edition, Prekindergarten through Grade 12.*

Step 4

Experts identified specific samples of Indiana Academic Standards (2014) in English Language Arts and Mathematics and Science (2010) that are directly linked to the WIDA English Language Development Standards.

Results

English/Language Arts Results

The study suggests that adequate linking exists across all grade clusters between the WIDA English Language Development Standards and the Indiana Academic Standards (2014) in English/Language Arts and Mathematics to meet the federal requirement of linking (U.S. Department of Education, Office of English Language Acquisition, February 2003). The overall relationship of the skills and concepts present in both sets of standards indicate the validity of applying the conclusions found in the *Alignment Study between the Common Core State Standards in English Language Arts and Mathematics and the WIDA English Language Proficiency Standards, 2007 Edition, Prekindergarten through Grade 12* to satisfy the minimum requirement of linking (page numbers referenced below).

Examples of Linking for English/Language Arts to WIDA ELD Standards:

Grade/Area	IAS 2014	CCSS	WIDA Link	Reference
K/Nonfiction Text	K.RN.1: Actively engage in group reading activities with purpose and understanding.	K.RI.10: Actively engage in group reading activities with purpose and understanding.		p. 18
1/Foundational Skills	1.RF.2.3: Recognize the components of a sentence (e.g., capitalization, first word, ending punctuation).	1.RF.1a: Recognize the distinguishing Features of a sentence (e.g., first word, capitalization, ending punctuation).		p. 18
2/Literature	2.RL.2.3: Describe how characters in a story respond to major events	2.RL.3: Describe how characters in a story respond to major events		p. 19

	and how characters affect the plot.	and challenges.		
3/Nonfiction Text	3.RN.2.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.	3.RI.1: Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.		p. 19
4/Literature	4.RL.2.1: Refer to details and examples in a text when explaining what a text says explicitly and when drawing inferences from the text.	4.RL.1: Refer to details and examples in a text when explaining what the text Says explicitly and when drawing inferences from the text.		p. 19
5/Nonfiction Text	5.RN.3.1: Apply knowledge of text features in multiple print and digital sources to locate information, gain meaning from a text, or solve a problem.	5.RI.7: Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.		p. 19
6/Literature	6.RL.2.3: Explain how a plot unfolds in a series of episodes as well as how the Characters respond or change as the narrative advances and moves toward a resolution.	RL.3: Describe how a particular story's or drama's plot unfolds in a series of episodes as well as how the characters Respond or change as the plot moves toward a resolution.		p. 19
7/Literature	7.RL.2.1: Cite several pieces of textual evidence to support analysis of what a text says explicitly as well as inferences drawn from the text.	RL.1: Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as Inferences drawn from the text.		p.19
8/Nonfiction Text	8.RN.2.1: Cite the textual evidence that most strongly supports an analysis of what a text says explicitly as well as inferences drawn from the text.	RI.1: Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as Inferences drawn from the text.		p. 19
9-10/Literature	9-10.RL.2.1: Cite strong and thorough textual evidence to support analysis of what a text says explicitly as well as inferences and	RL.1: Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn		p. 19

	interpretations drawn from the text.	from the text.		
11-12/Nonfiction Text	11-12.RN.2.3: Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of a text.	RI.3: Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.		p. 19

Sample Indiana Lesson Using the WIDA Standards Framework

GRADE: 8

ELD STANDARD: __Standard 2: The Language of Language Arts_____ **EXAMPLE TOPIC: Literature Analysis**

CONNECTION: *Indiana Academic Standards 2014 English/Language Arts (8.RL.4.2):* Analyze how works of literature draw on and transform earlier texts.

EXAMPLE CONTEXT FOR LANGUAGE USE: Students listen to class discussions about themes, patterns of events, or character types in a work of literature to make connections to their own lives and/or familiar stories or myths from their own cultures.

COGNITIVE FUNCTION: Students at all levels of English language proficiency EVALUATE universal themes of literature

	Level 1 Entering	Level 2 Emerging	Level 3 Developing	Level 4 Expanding	Level 5 Bridging	Level 6 - Reaching
LISTENING	Select illustrations depicting literary characters, themes, and plots based on oral statements using environmental print (e.g., posters about character types and themes)	Select illustrations depicting literary characters, themes, and plots based on oral descriptions using environmental print	Classify examples of literary characters, themes, and plots based on oral descriptions with a partner	Find patterns related to literary characters, themes, and plots using graphic organizers with a partner	Predict the evolution of literary characters, themes, and plots	

TOPIC-RELATED LANGUAGE: Students at all levels of English language proficiency interact with grade-level words and expressions, such as: universal theme, character type, allegory, mythology, protagonist

Mathematics Results

The study suggests that adequate linking exists across all grade clusters between the WIDA English Language Development Standards and the Indiana Academic Standards (2014) in English/Language Arts and Mathematics. The overall relationship of the skills and concepts present in both sets of standards indicate the validity of applying the conclusions found in the *Alignment Study between the Common Core State Standards in English Language Arts and Mathematics and the WIDA English Language Proficiency Standards, 2007 Edition, Prekindergarten through Grade 12* to satisfy the minimum requirement of linking (page numbers referenced below).

Examples of Linking for Mathematics to WIDA ELD Standards:

Grade /Area	IAS 2014	CCSS	WIDA Link	Reference
K/Measurement	MA.K.M.1: Make direct comparisons of the length, capacity, weight, and temperature of objects, and recognize which object is shorter, longer, taller, lighter, heavier, warmer, cooler, or holds more.	K.MD.1: Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.		p. 30
1/Computation and Algebraic Thinking	MA.1.CA.5: Solve real-world problems that call for addition of three whole numbers whose sum is within 20 (e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem).	1.OA.2: Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.		p. 31
2/Number Sense	MA.2.NS.1: Count by ones, twos, fives, tens, and hundreds up to at least 1,000 from any given number.	2.NBT.2: Count within 1000; skip-count by 5s, 10s, and 100s.		p. 31
3/Geometry	MA.3.G.4: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole (1/2, 1/3, 1/4, 1/6, 1/8).	3.G.2: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.		p. 31

4/Computation	MA.4.C.1: Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach.	4.NBT.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.		p. 31
5/Measurement	MA.5.M.4: Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths or multiplying the height by the area of the base.	5.MD.4: Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft., and improvised units.		p. 31
6/Data Analysis and Statistics	MA.6.DS.2: Select, create, and interpret graphical representations of numerical data, including line plots, histograms, and box plots.	6.SP.A.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.		p. 31
7/Data Analysis, Statistics, and Probability	MA.7.DSP.1: Understand that statistics can be used to gain information about a population by examining a sample of the population and generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.		p. 32
8/Number Sense	MA.8.NS.2: Use rational approximations of irrational numbers to compare the size of irrational numbers, plot them approximately on a number line, and estimate the value of expressions involving irrational numbers.	8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).		p. 32

9-12/Geometry	MA.G.QP.1: G.QP.1: Prove and apply theorems about parallelograms, including the following: opposite sides are congruent; opposite angles are congruent; the diagonals of a parallelogram bisect each other; and rectangles are parallelograms with congruent diagonals.	G-CO.11 Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.		p. 32

Sample Indiana Lesson Using the WIDA Standards Framework

GRADE: 11-12

ELD STANDARD: __Standard 3: The Language of Mathematics_____ **EXAMPLE TOPIC: Mathematical relations & functions**

CONNECTION: *Indiana Academic Standards 2014 Mathematics- Pre-Calculus (MA.PC.F.1):* For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

EXAMPLE CONTEXT FOR LANGUAGE USE: Students use mathematical abstractions in equations and graphs to represent real-life situations (e.g., using functions and graphs to analyze the lunar cycle, analyze motion graphs of a falling object or parabolic motion).

COGNITIVE FUNCTION: Students at all levels of English language proficiency UNDERSTAND properties of functions

	Level 1 Entering	Level 2 Emerging	Level 3 Developing	Level 4 Expanding	Level 5 Bridging	Level 6 - Reaching
SPEAKING	Name key properties of functions using graphs and equations in L1 (first language) or L2 (second language; English) with a partner	Give examples of key properties of functions using labeled graphs and equations with a partner	Describe how key properties of functions are represented using labeled graphs and equations	Summarize representations of key properties of functions in small groups (e.g., think aloud)	Explain with details representations of key properties of functions in small groups	

TOPIC-RELATED LANGUAGE: Students at all levels of English language proficiency interact with grade-level words and expressions, such as: periodicity, rate of change, quadratic functions, parabola

Science Results:

The study suggests that adequate linking exists across all grade clusters between the WIDA English Language Development Standards and the Indiana Academic Standards for Science. The overall relationship of the skills and concepts present in both sets of standards indicate the validity of applying the conclusions found in this study to satisfy the minimum requirement of linking (page numbers referenced below).

Examples of Linking for IAS Science (2010) to WIDA ELD Standards:

Grade Level	IAS Science	WIDA Standards		WIDA Link
Kindergarten	K.1.1 Use all senses as appropriate to observe, sort and describe objects according to their composition and physical properties, such as size, color and shape. Explain these choices to others and generate questions about the objects.	Non-Standard Measurement Tools	Rank size of objects described according to non-standard measurement tools with a partner as directed orally	
Kindergarten		Attributes	Arranged labeled icons or pictures of real life objects with 2 attributes by group membership as modeled.	
Kindergarten	K.2.1 Observe and record during sunny days when the sun shines on different parts of the school building.	Time	Depict times of day from illustrated scenes and models using icons, letters, or scribble writings	
Kindergarten	K.3.2 Describe and compare living animals in terms of shape, texture of body covering, size, weight, color and the way they move.	Animals	Classify pictures of animals with labels according to picture books.	
Kindergarten	Process Standards Discuss observations with peers and be able to support your conclusion with evidence.	Scientific Inquiry	Relate experiences from use of materials in scientific inquiry using phrases or short sentences with invented spellings.	

1-2	Process Standards Use a scientific notebook to record predictions, questions and observations about data with pictures, numbers or in words.	Graphs and Interpretation of Data	Interpret data on graphs from oral descriptions.	
1-2	1.1.2 Characterize materials as solid or liquid, investigate their properties, record observations and explain the choices to others based on evidence (i.e., physical properties).	Chemical and Physical Attributes	Identify objects according to chemical or physical properties from pictures and oral statements	
1-2	1.3.1 Classify living organisms according to variations in specific physical features (e.g., body coverings, appendages) and describe how those features may provide an advantage for survival in different environments.	Living Organisms	Compare living organisms according to their attributes using illustrated graphs or charts and text	
1-2	1.3.2 Observe organisms closely over a period of time in different habitats such as terrariums, aquariums, lawns and trees. Draw and write about observations.	Change	Explain the process of change in visuals using connected sentences	
3-5	Design Standards -Brainstorm potential solutions.	Strategies for problem solving	Explain different ways of problem solving, grade level examples using	

	-Select a solution to the need or problem. -Select the materials to develop a solution. -Create the solution. -Evaluate and test how well the solution meets the goal. -Communicate the solution with drawings or prototypes.		specific technical vocabulary	
3-5	2.3.1 Observe closely over a period of time and then record in pictures and words the changes in plants and animals throughout their life cycles-including details of their body plan, structure and timing of growth, reproduction and death.	Nature	Compare features of natural phenomena from real-life examples using specific and some technical vocabulary	
3-5	1.4.1 Use all senses as appropriate to sort objects as being composed of materials that are naturally occurring, human made or a combination of the two.	Ecology and conservation	Sort real-life objects according to labels (e.g., recyclable and not recyclable)	
3-5	4.3.4 Describe a way that a given plant or animal might adapt to a change arising from a human or non-human impact on its environment.	Body or living systems	Imagine how change affects systems or their parts (e.g., how might breaking an arm change your daily life.)	

3-5	5.2.1 Recognize that our earth is part of the solar system in which the sun, an average star, is the central and largest body. Observe that our solar system includes the sun, moon, seven other planets and their moons, and many other smaller objects like asteroids and comets.	Solar System	Evaluate the potential usefulness of astronomical objects (e.g., life on the moon, solar power)	
6-8	Process Standard Use the principles of accuracy and precision when making measurements.	Metric and standard units of measurement	Describe real-life situations where measurement is needed from illustrated scenes	
6-8	Process Standard Analyze data, using appropriate mathematical manipulation as required, and use it to identify patterns. Make inferences based on these patterns.	Measures of central tendency	Make predictions or estimates of measures of central tendency from oral scenarios and visual or graphic displays	
6-8	6.1.7 Explain that energy may be manifested as heat, light, electricity, mechanical motion, and sound and is often associated with chemical reactions.	Light and Sound	Classify examples of properties of light and sound based on illustrations and oral directions	
		Forms of Energy	Evaluate and defend uses of different forms of energy	
6-8	7.2.5 Describe the origin and physical properties of igneous,	Cycles/process	Match labeled diagrams of cycles or process with vocabulary from	

	metamorphic and sedimentary rocks and how they are related through the rock cycle.		word/phrase banks	
6-8	Process Standards Collect quantitative data with appropriate tools or technologies and use appropriate units to label numerical data	Scientific tools or instruments	Match scientific tools or instruments with pictures from oral statements (e.g., sundial)	
9-12	Process Standard Clearly communicate their ideas and results of investigations verbally and in written form using tables, graphs, diagrams and photographs.	Data displays and interpretation	Organize graphically displayed data from written directions and models (e.g., rank sports teams based on statistics) in small groups	
9-12	Process Standard Use analogies and models (mathematical and physical) to simplify and represent systems that are difficult to understand or directly experience due to their size, time scale or complexity. Recognize the limitations of analogies and models.	Scale and Proportion	Draw and compare dimensions (e.g., width, length, depth) of figures or real-life objects to scale	
9-12	C.2.6 Use the periodic table and electron configuration to determine an	Elements & compounds	Collect and share real-life examples of elements and compounds based on oral directions and	

	element's number of valence electrons and its chemical and physical properties.		models	
9-12	B.3.5 Describe how energy from the sun flows through an ecosystem by way of food chains and food webs and how only a small portion of that energy is used by individual organisms while the majority is lost as heat.	Ecology and Adaptation	Engage in debates on issues related to conservation or ecology (e.g., global warming, solar heating)	
9-12	B.7.2 Describe dominant, recessive, co-dominant, sex-linked, incompletely dominant, multiply allelic and polygenic traits and illustrate their inheritance patterns over multiple generations.	Genetics and heredity	Predict traits of individuals or groups based on visually supported text (e.g., combination of genes) with a partner	
9-12	Process Standard Develop explanations based on reproducible data and observations gathered during laboratory investigations. C.1.4 Describe physical and chemical changes at the molecular level.	Chemical and Physical Change	Create narrative lab reports based on science experiments involving chemical or physical change	

9-12	C.2.9 Understand that the radioactive decay process is random for any given atom but that this property leads to a predictable and measurable exponential decay of a sample of radioactive material. Know how to calculate the initial amount, the fraction remaining or the half-life of a radioactive isotope when given two of the other three variables.	Atoms & molecules/ Nuclear structures	Analyze processes involving atomic or molecular structures from oral descriptions of grade-level material (e.g., radioactive decay)	
9-12	B.4.1 Explain that the amount of life environments can support is limited by the available energy, water, oxygen and minerals and by the ability of ecosystems to recycle the remains of dead organisms.	Food Chains/Life Cycles	Discuss how food chains or life cycles within ecosystems are interdependent	

Sample Indiana Lesson Using the WIDA Standards Framework

GRADE: 5

ELD STANDARD: __Standard 4: The Language of Science_____ **EXAMPLE TOPIC: Solar System**

CONNECTION: *Indiana Academic Standards for Science 2010 (5.2.4):* Use a calendar to record observations of the shape of the moon and the rising and setting times over the course of a month. Based on the observations, describe patterns in the moon cycle.

EXAMPLE CONTEXT FOR LANGUAGE USE: Students explore a variety of informational texts and media to discover how Earth's rotation around the sun affects shadows, day and night, and the phases of the moon and extract pertinent information to create a class book to share with other students (and grade levels) who are also exploring day and night in science.

COGNITIVE FUNCTION: Students at all levels of English language proficiency EXAMINE the effects of Earth's rotation

	Level 1 Entering	Level 2 Emerging	Level 3 Developing	Level 4 Expanding	Level 5 Bridging	Level 6 - Reaching
WRITING	List words and phrases associated with Earth's rotation using realia (real objects) and graphic support with a partner	List the steps associated with Earth's rotation using graphic organizers and illustrated words banks in small groups	Describe the Earth's rotation in sentences using illustrated texts and graphic organizers in small groups	Explain and organize sentences associated with Earth's rotation from a variety of texts (e.g., books, media, encyclopedias) with a partner	Connect paragraphs associated with Earth's rotation using graphic organizers	

TOPIC-RELATED LANGUAGE: Students at all levels of English language proficiency interact with grade-level words and expressions, such as: Earth, rotation, phases of the moon

Summary

Findings from this alignment study generally suggest that there is strong linkage between the WIDA model performance indicators in Reading, Mathematics, and IAS Science (2010) and the Indiana Academic Standards (2014) in English/Language Arts and Mathematics, and Science. Federal guidance on the association between EL and state content standards directs that, at a minimum, EL Standards must be linked to state academic content standards.

Appendix A

WIDA/Common Core alignment study, retrieved from: http://wida.us/get.aspx?id=371

Appendix B

Indiana English/Language Arts correlation guides, retrieved from: http://www.doe.in.gov/standards/englishlanguage-arts

Indiana Mathematics correlation guides, retrieved from: http://www.doe.in.gov/standards/mathematics

Resources

Non-Regulatory Guidance for Title III State Formula Grant Program Part 1, retrieved from: http://www.ncela.us/files/uploads/5/2003T3guidancepart1_pdf.pdf